WHAT IS CLAIMED IS:

1. A method of inactivating microbes in a platelet composition, the method comprising illuminating the biological fluid with pulses of a light having at least one wavelength within a range of 170 to 2600 nm and a fluence greater than about 0.001 J/cm^2, the illumination effective for inactivating microbes in the platelet composition and for decreasing platelet aggregation by not more than about 40%.

2. The method of inactivating microbes of claim 1 wherein the platelet composition is illuminated with pulses of light having wavelengths within a spectral range of at least between about 240 nm and about 280 nm and having a pulse duration of less than 100 ms.

3. The method of inactivating microbes of claim 1 wherein the platelet composition is selected from the group consisting of platelet rich plasma, leukocyte reduced platelets, non-leukocyte reduced platelets, synthetic platelet substitutes, artificial platelets, recombinant platelet products, and mixtures thereof.

4. The method of inactivating microbes of claim 1 wherein the biological fluid is illuminated with an amount of light effective for providing a fluence level of about 0.1 to about 0.6 J/cm^2.

5. A method of inactivating microbes in a platelet composition, the method comprising illuminating the platelet solution with pulses of a light having at least one wavelength within a range of 170 to 2600 nm and a fluence level of about 0.05 to about 15 J/cm^2, the illumination effective for inactivating microbes in the platelet composition by at least about 2 logs, and for

decreasing platelet aggregation by not more than about 40%.

6. The method of inactivating microbes of claim 5 wherein the platelet composition is illuminated with pulses of light having wavelengths within a spectral range of at least between about 240 nm and about 280 nm and having a pulse duration of less than about 100 ms.

7. The method of inactivating microbes of claim 5 wherein the platelet composition is selected from the group consisting of platelet rich plasma, leukocyte reduced platelets, non-leukocyte reduced platelets, synthetic platelet substitutes, artificial platelets, recombinant platelet products, and mixtures thereof.

8. A method of inactivating microbes in a platelet composition, the method comprising:

flowing the platelet composition through a treatment chamber, the treatment chamber being light transmissive to at least 1% of a light treatment having at least one wavelength within a range of 170 to 2600 nm;

illuminating the platelet composition with the light as the platelet composition is flowed through the flexible treatment chamber;

inactivating microbes within the platelet composition,

the method effective for inactivating microbes in the platelet composition by at least about 2 logs, and for decreasing platelet aggregation by not more than about 40%.

9. The method of inactivating microbes of claim 8 wherein the illuminating step comprises illuminating the platelet composition with pulses of light.

10. The method of inactivating microbes of claim 8 wherein the platelet composition is illuminated with pulses of light having wavelengths within a spectral range of at least between about 240 nm and about 280 nm and having a pulse duration of less than 100 ms.

11. The method of inactivating microbes of claim 8 wherein at least 1% of the fluence of the pulses of light is concentrated at wavelengths within a range of 200 to 300 nm.

12. The method of inactivating microbes of claim 8 wherein the platelet composition is flowed through the treatment chamber at a constant flow rate.

13. The method of inactivating microbes of claim 8 wherein the biological fluid is selected from the group consisting of platelet rich plasma, leukocyte reduced platelets, non-leukocyte reduced platelets, synthetic platelet substitutes, artificial platelets, recombinant platelet products, and mixtures thereof.

14. A method for increasing shelf-life of a platelet composition, the method comprising:

illuminating the platelet composition with pulses of a light having at least one wavelength within a range of 170 to 2600 nm and a fluence greater than about 0.001 J/cm^2, and

repeating the illumination of the platelet composition every 6 hours, the illumination effective for inactivating microbes and for providing a zero net increase of microbial counts in the platelet composition,

wherein platelet aggregation is not decreased by more than about 40%.

15. The method of inactivating microbes of claim 14 wherein the platelet composition is illuminated with pulses of light having wavelengths within a spectral range of at least between about 240 nm and about 280 nm and having a pulse duration of less than 100 ms.

16. The method of inactivating microbes of claim 14 wherein the platelet composition is illuminated with an amount of light effective for providing a fluence level of about 0.1 to about 0.6 J/cm^2.

17. A method for inactivating an endogenous nucleic acid strand, the method comprising illuminating an organisms containing the nucleic acid strand with at least one high-intensity, short duration pulse of incoherent polychromatic light in a broad spectrum.

18. The method according to Claim 17, wherein the nucleic acid to be inactivated is endogenous and contained as part of a mammalian cell, a eukaryotic cell, plant cell, biological tissue, tumor cells, chloroplast, cellular organelle, virus, bacteria, fungi, phage, transposon, spores, vaccine, antigen, prion, vector, or mixtures thereof.

19. A method for inactivating microbes in a platelet composition, the method comprising:

illuminating the platelet composition with pulses of a light having at least one wavelength within a range of 170 to 2600 nm and a fluence greater than about 0.001 J/cm^2, and

repeating the illumination of the platelet composition every 6 hours, the illumination effective for inactivating microbes and for providing a zero net increase of microbial counts in the platelet composition,

wherein platelet aggregation is not decreased by more than about 40%.

20. The method of inactivating microbes of claim 19 wherein the platelet composition is illuminated with pulses of light having wavelengths within a spectral range of at least between about 240 nm and about 280 nm and having a pulse duration of less than 100 ms.

21. The method of inactivating microbes of claim 19 wherein the platelet composition is illuminated with an amount of light effective for providing a fluence level of about 0.1 to about 0.6 J/cm^2.